## CLAIMS

We claim:

1. A method of compressing ATM headers in ATM cells for communication across and ATM network; comprising the steps of:

transmitting a first ATM header in an uncompressed format to a receiver in the ATM network;

generating a compressed ATM header for an ATM cell from an uncompressed ATM header that corresponds to a data payload, wherein the data payload is to be communicated across the ATM network;

transmitting the ATM cell with the compressed ATM header and the data payload to the receiver, wherein the compressed ATM header enables transmission of a greater number of ATM cells than the uncompressed ATM header.

2. The method of claim 1, wherein the compressed ATM header is generated according to the differences in the uncompressed ATM header as compared to the first ATM header.

3. The method of claim 1, wherein the compressed ATM header is generated and transmitted to the receiver periodically to indicate to the receiver that the first ATM header corresponds to the transmitted ATM cell.

4. The method of claim 1, wherein the compressed ATM header is a dictionary indicating to the receiver the changes to be made to the first ATM header for subsequently transmitted ATM cells.

5. The method of claim 1, wherein the compressing step is performed by a computer.

6. A system for compressing ATM headers in ATM cells for communication across and ATM network; comprising:

a computer, wherein the computer includes an ATM interface coupled to the ATM network;

logic configured for the ATM interface to transmit a first ATM header in an uncompressed format to a receiver in the ATM network;

logic configured to generate a compressed ATM header for an ATM cell from an uncompressed ATM header that corresponds to a data payload;

logic configured to transmit the ATM cell with the compressed ATM header and the data payload to the receiver.

7. The system of claim 6, wherein the compressed ATM header is generated according to the differences in the uncompressed ATM header as compared to the first ATM header.

8. The system of claim 6, wherein the compressed ATM header is generated and transmitted to the receiver periodically to indicate to the receiver that the first ATM header is to be used for the ATM cell.

9. The system of claim 6, wherein the compressed ATM header is a dictionary header indicating to the receiver the changes to be made to the first ATM header.

10. A method of compressing ATM headers for communication across and ATM network; comprising the steps of:

transmitting an initial full ATM header and a first data payload to a receiver in the ATM network;

determining that a subsequent data payload is available for transmission to the receiver;

generating a delta encoded compressed ATM header from an uncompressed ATM header for the subsequent data payload based on changed bits in the uncompressed ATM header for the subsequent data payload as compared to a previous uncompressed ATM header, wherein the delta encoded compressed ATM header is one to five bytes in size depending upon the number and index location of the changed bits; and

transmitting the delta encoded compressed ATM header and the subsequent payload to the receiver.

11. The method of claim 1, further comprising the steps of:

creating the delta encoded compressed ATM header according to a first delta encoding technique when a select number of bits of the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are unchanged.

12. The method of claim 2, wherein the delta encoded compressed ATM header is one byte.

13. The method of claim 2, wherein the select number of bits that are unchanged are bits residing in bit index locations 7 to 31.

14. The method of claim 1, further comprising the steps of:

creating the delta encoded compressed ATM header according to a second delta encoding technique when a minimum changed indexed bit and a maximum changed indexed bit in the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are within a same encoded byte.

15. The method of claim 4, wherein the delta encoded compressed ATM header is two bytes.

16. The method of claim 1, further comprising the steps of:

creating the delta encoded compressed ATM header according to a third delta encoding technique when a minimum changed indexed bit and a maximum changed indexed bit in the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are not within a same encoded byte.

17. The method of claim 1, further comprising the steps of:

initiating a refresh counter to determine a time to send a refresh byte in the delta encoded compressed ATM header.

18. The method of claim 7, further comprising the steps of:

determining whether the refresh counter has reached a threshold value.

19. The method of claim 8, wherein the refresh counter is incremented if the refresh counter has reached the threshold value.

20. The method of claim 8, wherein a refresh byte is added to the uncompressed ATM header for the subsequent data payload if the refresh counter has not reached the threshold value.

21. The method of claim 8, wherein the refresh counter is restarted upon the refresh byte being added to the ATM header for the subsequent data payload.

22. The method of claim 1, further comprising the steps of:

dropping one byte of the uncompressed ATM header for the subsequent data payload corresponding to the header error control bits prior to the generating step.

23. The method of claim 1, further comprising the steps of:

sending an idle byte if the subsequent data payload is not available for transmission to the receiver.

24. An computer for communicating compressed ATM headers over an ATM network, comprising:

a processor;

a computer memory;

a communications interface, the communications interface being communicably coupled to the ATM network;

logic configured to transmit an initial full ATM header and a first data payload to a receiver in the ATM network;

logic configured to generate a compressed ATM header from an uncompressed ATM header for the subsequent data payload based on a differential as compared to a previous uncompressed ATM header, wherein the length of the compressed ATM header corresponds to the number and index location of differential bits; and

logic configured to transmit the compressed ATM header and the subsequent payload to the receiver in the ATM network.

25. The computer of claim 24, further comprising:

logic configured to encoded the compressed ATM header according to a first delta encoding technique if a select number of bits of the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header data payload are unchanged.

26. The computer of claim 24, further comprising:

logic configured to encoded the compressed ATM header according to a second delta encoding technique if a minimum changed indexed bit and a maximum changed indexed bit in uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are within a same encoded byte.

27. The computer of claim 24, further comprising:

logic configured to encoded the compressed ATM header according to a third delta encoding technique if a minimum changed indexed bit and a maximum changed indexed bit in the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are not within a same encoded byte.

28. The computer of claim 24, further comprising:

logic configured to drop one byte of the uncompressed ATM header for the subsequent data payload corresponding to the header error control bits prior to generating the compressed ATM header.

29. A method for transmitting ATM cells to a receiver with a compressed ATM header that is a length less than one byte, comprising the steps of:

transmitting a synchronization message to a receiver;

receiving a response from the receiver indicating that the receiver is operation and synchronized;

transmitting a first ATM header to the receiver in an uncompressed format;

transmitting a message with a cell count indicator indicating whether subsequent ATM cells correspond to the first ATM header;

including an index bits indicator in the message that identifies a second ATM header that corresponds to subsequent ATM cells; and

transmitting ATM cells without sending either of the first or second ATM header.

30. The method of claim 29, wherein the message contains a table reset bit instructing the receiver to clear and rebuild an ATM header stored at the receiver.

31. The method of claim 29, wherein the message contains a challenge bit instructing the receiver to respond with a reply bit.

32. The method of claim 29, wherein the identified second ATM header is contained in the receiver.

33. The method of claim 29, wherein the identified second ATM header is transmitted subsequent to the synchronization message.

34. An system for communicating compressed ATM headers over an ATM network, comprising:

means for processing instructions;

means for storing data electronically;

means for generating an initial full ATM header and a first data payload to a receiver in the ATM network;

means for generating a compressed ATM header from an uncompressed ATM header for the subsequent data payload based on a differential as compared to a previous uncompressed ATM header, wherein the length of the compressed ATM corresponds to the number and index location of differential bits; and

means for communicating the compressed ATM header and the subsequent payload to the receiver in the ATM network.

35. The system of claim 34, further comprising:

means for compressing the ATM header according to a first delta encoding technique if a select number of bits of the uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header data payload are unchanged.

36. The system of claim 34, further comprising:

means for compressing the ATM header according to a second delta encoding technique if a minimum changed indexed bit and a maximum changed indexed bit in uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are within a same encoded byte.

37. The system of claim 34, further comprising:

means for compressing the ATM header according to a third delta encoding technique if a minimum changed indexed bit and a maximum changed indexed bit in uncompressed ATM header for the subsequent data payload as compared to the previous uncompressed ATM header are not within a same encoded byte.

38. A method of compressing ATM headers for communication across and ATM network; comprising the steps of:

synchronizing a transmitter and a receiver in the ATM network;

transmitting a first full ATM header and a first data payload to the receiver in the ATM network;

generating a compressed ATM header with an index that identifies an existing ATM header previously received at the receiver, wherein the compressed ATM header is used for a subsequent data payload that has an uncompressed ATM header that is unchanged from the first full ATM header;

generating a new full ATM header for the subsequent data payload that instructs the receiver to add the new full ATM header to a header table in the receiver, wherein the new full ATM header is different from the first full ATM header; and

transmitting the compressed ATM header with an index periodically when a subsequent ATM header for the subsequent data payload is unchanged in relation to the existing ATM header previously received at the receiver.

39. The method of claim 38, wherein the compressed ATM header with an index is less than one byte in length.

40. The method of claim 38, wherein the synchronizing step includes the following steps:

indicating to the receiver to clear and rebuild the header table; and

transmitting a challenge bit to determine whether the receiver is operational.

41. The method of claim 38, further comprising the step of:

indicating that the subsequent data payload is being sent without additional overhead bytes.